CLAIMS

What is claimed is:

1. A method of treating multiple myeloma or lymphoma in a patient, the method comprising administering to the patient, a recombinant antibody-based molecule comprising two targeting units and two antigenic units connected through a dimerization motif, or a nucleic acid encoding said recombinant antibody-based molecule

2. The method of claim 1, wherein administering the nucleic acid comprises delivering the nucleic acid by electroporation.

3. The method of claim 1, wherein said targeting unit(s) is/are a single chain fragment variable of Ig (scFv).

4. The method of claim 3, wherein said scFv is anti-HLA, anti-CD14, anti-CD40, or anti-toll-like receptor.

5. The method of claim 4, wherein said anti-HLA is anti-HLA-DP.

6. The method of claim 4, wherein said anti-toll-like receptor is anti-toll-like receptor 2.

7. The method of claim 1, wherein at least one targeting unit is a ligand.

8. The method of claim 7, wherein said ligand is soluble CD40 ligand or a chemokine.

9. The method of claim 7, wherein said ligand is a chemokine.

10. The method of claim 9, wherein said chemokine is RANTES or MIP-1α.

11. The method of claim 9, wherein said chemokine is MIP-1α.

12. The method of claim 1, wherein at least one targeting unit is a bacterial antigen.

13. The method of claim 12, wherein the bacterial antigen is a flaggelin.

14. The method of claim 1, wherein the targeting units have the ability to target antigen presenting cells (APC).

15. The method of claim 1, wherein the targeting units have the ability to target HLA-DP, CD14, CD40, toll-like receptors, or a chemokine receptors.

16. The method of claim 15, wherein said HLA is HLA-DP

17. The method of claim 1, wherein the targeting units have the ability to target chemokine receptors.

18. The method of claim 1, wherein the antigenic unit(s) is/are an antigenic scFv.

19. The method of claim 18, wherein the antigenic scFv is derived from a monoclonal Ig produced by myeloma or lymphoma.

20. The method of claim 18, wherein the antigenic unit(s) is/are a telomerase, or a functional part thereof.

21. The method of claim 20, wherein said telomerase is hTERT.

22. The method of claim 1, wherein the antigenic unit(s) is/are derived from a bacterium.

23. The method of claim 22, wherein the bacterium derived antigenic unit(s) is/are a tuberculosis antigen.

24. The method of claim 1, wherein the antigenic unit(s) is/are derived from a virus.

25. The method of claim 24, wherein the virus derived antigenic unit(s) is/are derived from HIV.

26. The method of claim 25, wherein the HIV derived antigenic unit(s) is/are derived from gp120.

27. The method of claim 1, wherein the dimerization motif comprises a hinge region and an immunoglobulin domain.

28. The method of claim 27, wherein the hinge region is Ig derived.

29. The method of claim 27, wherein the hinge region has the ability to form one or several covalent bonds.

30. The method of claim 29, wherein the covalent bond is a disulphide bridge.

31. The method of claim 27, wherein the immunoglobulin domain is a carboxyterminal C domain, or a sequence that is substantially homologous to said C domain.

32. The method of claim 31, wherein the carboxyterminal C domain is derived from IgG.

33. The method of claim 27, wherein the immunoglobulin domain has the ability to homodimerize.

34. The method of claim 33, wherein said immunoglobulin domain has the ability to homodimerize via noncovalent interactions.

35. The method of claim 34, wherein said noncovalent interactions are hydrophobic interactions.

36. The method of claim 1, comprising administering the nucleic acid to the patient to induce production of the recombinant antibody-based molecule.

37. The method of claim 1, comprising administering a vector comprising the nucleic acid.

38. A recombinant antibody-based molecule comprising two targeting units and two antigenic units connected through a dimerization motif, or a nucleic acid encoding said recombinant antibody-based molecule.

39. The recombinant molecule of claim 38, wherein at least one targeting unit is a single chain fragment variable of Ig (scFv).

40. The recombinant molecule of claim 39, wherein said scFv is anti-HLA, anti-CD14, anti-CD40, or anti-toll-like receptor.

41. The recombinant molecule of claim 40, wherein said anti-HLA is anti-HLA-DP.

42. The recombinant molecule of claim 40, wherein said anti-toll-like receptor is anti-toll-like receptor 2.

43. The recombinant molecule of claim 38, wherein at least one targeting unit is a ligand.

44. The recombinant molecule of claim 43, wherein said ligand is soluble CD40 ligand or a chemokine.

45. The recombinant molecule of claim 43, wherein said ligand is a chemokine.

46. The recombinant molecule of claim 45, wherein said chemokine is RANTES or MIP-1α.

47. The recombinant molecule of claim 45, wherein said chemokine is MIP-1α.

48. The recombinant molecule of claim 38, wherein at least one targeting unit is a bacterial antigen.

49. The recombinant molecule of claim 48, wherein the bacterial antigen is a flaggelin.

50. The recombinant molecule of claim 38, wherein the targeting units have the ability to target antigen presenting cells (APC).

51. The recombinant molecule of claim 38, wherein the targeting units have the ability to target HLA, CD14, CD40, toll-like receptors, or chemokine receptors.

52. The recombinant molecule of claim 51, wherein said HLA is HLA-DP.

53. The recombinant molecule of claim 38, wherein the targeting units have the ability to target chemokine receptors.

54. The recombinant molecule of claim 38, wherein at least one antigenic unit is an antigenic scFv.

55. The recombinant molecule of claim 54, wherein the antigenic scFv is derived from a monoclonal Ig produced by myeloma or lymphoma.

56. The recombinant molecule of claim 38, wherein at least one antigenic unit is a telomerase, or a functional part thereof.

57. The recombinant molecule of claim 56, wherein said telomerase is hTERT.

58. The recombinant molecule of claim 38, wherein at least one antigenic unit is derived from a bacterium.

59. The recombinant molecule of claim 58, wherein the bacterium derived antigenic unit(s) is/are a tuberculosis antigen.

60. The recombinant molecule of claim 38, wherein at least one antigenic unit is derived from a virus.

61. The recombinant molecule of claim 60, wherein the virus derived antigenic unit is derived from HIV.

62. The recombinant molecule of claim 61, wherein the HIV derived antigenic unit is derived from gp120.

63. The recombinant molecule of claim 38, wherein the dimerization motif comprises a hinge region and an immunoglobulin domain.

64. The recombinant molecule of claim 63, wherein the hinge region is Ig derived.

65. The recombinant molecule of claim 63, wherein the hinge region has the ability to form one or several covalent bonds.

66. The recombinant molecule of claim 65, wherein the covalent bond is a disulphide bridge.

67. The recombinant molecule of claim 63, wherein the immunoglobulin domain is a carboxyterminal C domain, or a sequence that is substantially homologous to said C domain.

68. The recombinant molecule of claim 67, wherein the carboxyterminal C domain is derived from IgG.

69. The recombinant molecule of claim 63, wherein the immunoglobulin domain has the ability to homodimerize.

70. The recombinant molecule of claim 63, wherein said immunoglobulin domain has the ability to homodimerize via noncovalent interactions.

71. The recombinant molecule of claim 70, wherein said noncovalent interactions are hydrophobic interactions.

72. The recombinant molecule of claim 38, comprising a nucleic acid formulated for administration to a patient to induce production of the recombinant antibody-based molecule.

73. The recombinant molecule of claim 38, wherein the nucleic acid is comprised by a vector.

74. The recombinant molecule of claim 73, wherein said vector is comprised by a cell line.

75. The recombinant molecule of claim 38, wherein the nucleic acid is comprised by a cell line.

76. A pharmaceutical composition comprising a recombinant molecule of claim 38 and a physiologically acceptable diluent or carrier.

77. A method of preparing a recombinant antibody-based molecule comprising:

a. transfecting the vector of claim 73 into a cell population;

b. culturing the cell population;

c. collecting recombinant protein expressed from the cell population; and

d. purifying the expressed protein.

78. A vaccine composition against cancer or infectious diseases comprising an immunologically effective amount of the nucleic acid of claim 38 or degenerate variants thereof, wherein said composition is able to trigger both a T-cell- and B-cell immune response.

79. The composition of claim 78, further comprising a pharmaceutically acceptable carrier.

80. The composition of claim 78, wherein said cancer is multiple myeloma or lymphoma.

81. The composition of claim 78, wherein said infectious disease is AIDS or tuberculosis.

82. A kit for preparation of a recombinant antibody-based molecule of claim 38.